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THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Program

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November 27, 2013

David Smith
Koch Remediation & Environmental Services
4111 E 37th St N
Wichita, KS 67220-3203

Loren Garner
Flint Hills North Pole Refinery
1150 H&H Lane
North Pole, AK 99705

Re: Conditional Approval of the Revised Draft Final Human Health Risk Assessment, Flint Hills Resources Alaska, LLC, North Pole Refinery; North Pole, Alaska; May 2012

Dear Mr. Smith and Mr. Garner:

The Alaska Department of Environmental Conservation (DEC) has completed its review of the Revised Draft Final Human Health Risk Assessment (HHRA) submitted by Flint Hills Resources (FHR), dated May 2012. Subsequent to the submission of the document, DEC and FHR have also had many discussions related to cleanup and risk management at the site. As noted below, some of the information and analyses made in the Revised Draft Final HHRA are no longer accurate or representative of the most current conditions at the site. In addition, FHR included in the HHRA two different risk assessments for sulfolane, based on differing assumptions, but only one of these (in Chapter 3) meets DEC's criteria for approval. In accordance with 18 AAC 75.345(b)(2), DEC finds that the groundwater alternative cleanup level for sulfolane derived in Chapter 5 of 14 µg/L based on the risk characterization in Chapter 3 is protective of human health, safety and welfare, and of the environment, and approves the HHRA subject to the following three conditions:

1) Chapter 4 of the Revised Draft Final HHRA, as well as its supporting appendices (i.e., portions of Appendix D, portions of Appendix E, Appendix F, Appendix G, derivation of the alternative reference dose for sulfolane from Appendix H, and portions of Appendix J) is not approved in the final HHRA. The approach taken in Chapter 4 of the Revised Draft Final HHRA, as well as its appendices as listed above, is not an approach authorized by DEC regulations or risk assessment guidance documents and is, therefore, not approved and should not be included in the HHRA. Chapter 5 of the HHRA is approved only as regards the alternative cleanup levels (ACLs) derived using the reference dose from the United States Environmental Protection Agency's Provisional Peer-Revised Toxicity Value (PPRTV) for Sulfolane (dated January 30, 2012) and the DEC approved exposure assumptions. DEC will make site determinations based on the assessment from Chapter 3 of the HHRA, which is approved. Chapter 3 includes exposure and toxicity assessments that follow the DEC-approved approach.

2) FHR shall incorporate DEC's required changes to the HHRA as outlined in the attached comment matrix. All comments need to be addressed to DEC's satisfaction and as described in the comment matrix.

3) The HHRA shall be updated to include the most recent site data. Significant additional site characterization work has been conducted since the Revised Draft Final HHRA was submitted. In addition, DEC and FHR

have had many discussions related to cleanup and risk management at the site in the past year, and these efforts have shown that some of the assumptions made in the Revised Draft Final HHRA are no longer accurate or representative of current conditions. To document these changes FHR must include a reference to the revised conceptual site model and must also include all substantial updates in the site data, including the documented increases in sulfolane concentrations in groundwater. The new data must be included in the risk assessment to ensure the increased risk to human health posed by exposure to sulfolane through various pathways is mitigated in the final cleanup decisions at the site. These changes are not expected to change the site-specific cleanup level or the overall direction of the work. Specifically, the following items must be added to the HHRA:

- Discuss current groundwater sulfolane plume dynamics at the site (including a consideration of the 2013 data) in the HHRA.
- Update reported groundwater concentrations of sulfolane both on and off the refinery property using currently available data, and re-calculate and evaluate the hazards of revised exposure point concentrations (EPCs) based on the updated groundwater concentrations.
- Re-evaluate groundwater concentrations for all compounds of potential concern (COPCs) on the refinery property based on the most current data and to determine if updated EPCs are needed, and if so, include the revised EPCs in the HHRA.
- Revise the evaluation of surface water, including the updates to the ecological and human health conceptual site models and hazard evaluations for off-site receptors, to incorporate the 2013 surface water results.
- Update and incorporate the most recent data regarding on-site soil concentrations of sulfolane and other COPCs. For sulfolane, revised EPCs and hazards must be calculated based on the updated soils data.
- Add a discussion of perfluorinated compounds, specifically PFOS and PFOA, to the HHRA as compounds of potential concern at the site.
- Add an evaluation of the vapor intrusion of volatile compounds from wells with LNAPL in the HHRA.
- Revise the HHRA to incorporate the data obtained during the 2013 field season, which was required to fill particular data gaps. Those remaining data gaps addressed during 2013 include:
    - Soil sampling from residential gardens off-site.
    - Soil gas sampling from on-site locations.
    - Analysis of potential intermediates in groundwater.

The HHRA shall be resubmitted to DEC by March 28, 2014 with the required updates and additions. If you have any further questions regarding this approval or the attached comment matrix, please contact me at 907-451-2192 or via e-mail at tamara.cardona@alaska.gov.

Sincerely,

T. Cardona

Tamara Cardona, PhD
Contaminated Sites Project Manager

Enclosure: Comment Matrix: Draft Final Human Health Risk Assessment; Flint Hills North Pole Refinery; North Pole, Alaska; May 2012

CC. Rick Albright, EPA Region 10
Kristin Ryan, DEC Division of Spill Prevention and Response Division Director
Steve Bainbridge, DEC Contaminated Sites Program Manager

Comment Matrix: Draft Final Human Health Risk Assessment; Flint Hills North Pole Refinery; North Pole, Alaska; May 2012

<table>
<tr><th>No.</th><th>Section</th><th>Comment / Recommendation</th><th>Status</th></tr>
<tr><td>1</td><td>General</td><td>Based on the results presented in the Perfluorinated Compounds Investigation Report (February 2013), perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) have been found in groundwater onsite at concentrations above Alaska Department of Environmental Conservation (DEC) risk-based levels of 3.1 ug/L for PFOA and 1.3 ug/L PFOS. Based on these results, PFOA and PFOS must be included as compounds of potential concern (COPCs) and evaluated in the human health risk assessment (HHRA).</td><td>Medium, Technical</td></tr>
<tr><td>2</td><td>General</td><td>Previous residential off-site soil samples consisted of 4 samples from two separate properties, each had a greenhouse and outdoor soil sample from the gardens. The samples were taken in October 2011 and sulfolane-free water was used to water all the locations during the 2011 growing season. In addition, at the time information on potential uptake of sulfolane in soil to plants was trying to be obtained so the top three inches was removed and the soil was taken from the 3 to 9 in. below ground surface interval (root area). For direct human exposure, the top two inches of soil would be of interest, as well as an area where the well water was used for watering, i.e., lawn or flower bed. In 2013, ERM for DEC collected samples at various residences known to water their gardens with impacted water. Samples resulted in non-detectable concentrations but were analyzed outside of holding time due to matrix interference with the sample; thus, these samples have been rejected. Additional surface soil samples from off-site areas watered by sulfolane-impacted water should be collected to confirm the summer 2013 sulfolane results.</td><td>Medium, Technical</td></tr>
<tr><td>3</td><td>General</td><td>Additional information is known regarding the groundwater sulfolane plume dynamics since the time of the draft final HHRA. The stability of the plume boundaries and concentrations must be discussed in the HHRA. Increasing sulfolane concentrations or additional areas being impacted could result in the assumptions used in the HHRA to be no longer valid and may result in the HHRA needing to be updated or re-evaluated.</td><td>High, Technical</td></tr>
<tr><td>4</td><td>General</td><td>The maximum off-site groundwater sulfolane concentration used in the HHRA is 443 ug/L from PW-0228 sampled in November 28, 2009. Since the HHRA, higher concentrations have been found off-site including the maximum detected concentration of 558 ug/L in PW-1230 (this value is based on the First Quarter 2013 monitoring report. The maximum detected concentration has increased in subsequent monitoring reports). Using the higher concentration of 558 ug/L in groundwater, the hazard quotients (HQs) for off-site residents change slightly, as shown in the table below:
<table>
<tr><th rowspan="2">Route of Exposure</th><th colspan="3">HQ using sulfolane @ 443 ug/L</th><th colspan="3">HQ using sulfolane @ 558 ug/L</th></tr>
<tr><th>Adult</th><th>Child</th><th>Infant</th><th>Adult</th><th>Child</th><th>Infant</th></tr>
<tr><td>Ingestion of Groundwater</td><td>12</td><td>28</td><td>7</td><td>15</td><td>36</td><td>8</td></tr>
<tr><td>Ingestion of Home Grown Produce</td><td>0.8</td><td>2.3</td><td>0.3</td><td>1.0</td><td>2.9</td><td>0.4</td></tr>
</table></td><td>Medium, Technical</td></tr>
</table>

No.	Section	Comment / Recommendation	Status
		Total Hazard Index from Exposure to Groundwater | **12.8** | **30.3** | **7.3** | **16** | **38.9** | **8.4** Hazards for all off-site scenarios must be recalculated using the most recent groundwater concentrations.	
5	1 and throughout	The third paragraph indicates the results of the pore-water evaluation do not change the conclusions of the ecological conceptual site model (CSM). Previous versions of the HHRA stated that the ecological CSM will be revisited, if necessary, after evaluating the new data. In June 2013, ERM, for DEC, collected surface water samples off-site, including three sampling locations along Badger Slough, and found no detections of sulfolane in surface water (data are presented in the November 2013 *Final Report, North Pole Gravel Pond and Slough Sampling Pits*). The ecological CSM must be updated to include this information. Exposure of ecological receptors to sulfolane in surface water is considered an incomplete pathway.	Medium, Technical
6	1, 4, 5 and throughout	DEC's July 19, 2012 letter to Loren Garner, Flint Hills Resources-Alaska (FHR-Alaska), states that, "...the Department has concluded that the EPA's PPRTV of 0.001 milligrams per kilogram body weight per day (mg/kg-d) for chronic oral exposure should be used to finalize the HHRA. Furthermore, the Department has determined that the ADEC accepted exposure parameters for the child chronically exposed to sulfolane in groundwater, as presented in the HHRA, should be used to determine the alternative cleanup level (ACL) at the site. This results in an ACL of 14 microgram per liter (ug/L) for sulfolane." This letter should be referenced and all references to a range of potential ACLs at the site must be removed. The ARCADIS Comparative Scenario, as presented in Chapter 4 of the HHRA, is not acceptable or approved by DEC.	High, Policy
7	2.6, 3.1.2.4 and General	Eliminate the discussion of work "to be" performed in 2012. A risk assessment is a snap shot in time of potential hazards and risks based on current contaminant concentrations. At the time of the *Revised Draft Final Human Health Risk Assessment* (May 2012) there were a number of data gaps identified. Since then a significant amount of field work has been conducted to address those data gaps. The risk assessment must be updated to incorporate this additional data from 2012 and 2013. This includes additional groundwater, soil and surface water data. COPC concentrations should be updated and additional compounds of interest (COIs; i.e., PFOA, PFOS) must be included as COIs and evaluated in the HHRA.	High, Technical
8	2.4	Other uses of groundwater, besides just ingestion, must be discussed. For those residents using bulk water tanks (depending on set-up) or bottled water, exposure may not have been eliminated, but controlled and reduced. Exposure through other routes of exposure may not pose a health risk, as described by Alaska Department of Health and Social Services (DHSS; January 2012) but could be complete exposure pathways. Specifically, DHSS (January 2012) concluded that using water containing sulfolane from North Pole private wells for most household activities will not harm people's health. These household activities include bathing, washing clothes and dishes, rinsing foods, and making foods where the water is discarded, e.g., boiling eggs.	Medium, Technical

No.	Section	Comment / Recommendation	Status
		DHSS indicated that based on currently available information, using well water to shower does not pose a health risk for North Pole residents.	
9	2.6.3 3.1, 3.1.1.2 and Figure 3-1 and throughout	It is assumed in the report that the water collected from piezometers in 2012 potentially resulted in higher concentrations than would be found in true pore-water samples. In June 2013, surface water samples from off-site gravel pits and ponds were collected and were reported in the November 2013 the *Final Report, North Pole Gravel Pond and Slough Sampling Pits.* All surface water sample results were non-detect for sulfolane. This data must be incorporated into the risk assessment. The quantitative evaluation of ingestion of sulfolane while swimming using the 2012 piezometer data can remain in the report but discussion must be added to indicate that the assumptions are conservative and health protective estimates of surface water concentrations based on the 2013 results. The off-site conceptual site model (CSM) and associated text must also be updated to incorporate this data.	Medium, Technical
10	2.6.1	There has been significant additional soil sampling on-site since the HHRA. The concentrations used in the HHRA are no longer representative of current knowledge of soil concentrations. For instance, the maximum sulfolane concentration found in on-site soil at the time of the HHRA was 18.5 mg/kg. Per the *Site Characterization Report, 2012 Addendum (2013),* the highest on-site sulfolane concentration in soil is 724 mg/kg, and additional work in 2013 indicates that even higher concentrations are found on site. These changes in concentration will impact the hazard quotients for onsite receptors. As an example, the change in concentration to 724 mg/kg sulfolane in soil results in a change in the HQ from trench worker exposure to sulfolane in soil from 0.003 to 0.1, both still below DEC's criteria. Soil exposure point concentration (EPCs) must be re-calculated for all COPCs using the most recent concentrations..	High, Technical
11	2.6.1, 3.1.2.1, and Table 3-2a	Please reference the Level IV validation and review by Environmental Standards, Inc. that supports rejecting the O-2 sample from 2010. As discussed previously, rejecting this sample is appropriate with the proper documentation and explanation. That material must be provided or referenced here. The result from the rejected sample O-2 still shows up in Table 3-2a, please update. Please verify that this value is not used in the EPC calculations.	Medium, Technical
12	2.6.3 and 3.1.2.4	The degradation of sulfolane in surface water has not been shown. Results from the 2013 surface water sampling event, showing no detections of sulfolane in surface water off-site, must be incorporated into this discussion. Eliminate references to degradation of sulfolane in surface water.	Medium, Technical
13	3.1.1.3	The statement that assessment of infants is included in the HHRA "…because the Agency for Toxic Substances and Disease Registry and the State of Alaska Department of Health and Social Services have addressed infants as a separate receptor group in their Health Consultation" does not address the main reason for evaluating infants as a separate receptor group for exposure to sulfolane. Infants are a receptor group that potentially was exposed to sulfolane in groundwater. Please eliminate the second sentence on page 15.	Medium, Policy

No.	Section	Comment / Recommendation	Status
14	3.1.1.3	The statement, "There is evidence that sulfolane does not present a significant risk for developmental effects and it is not mutagenic," is not fully accurate and must be reworded. There is only one developmental study (Zhu et al. 1987). In addition, the developmental study did show skeletal abnormalities in mice pups, albeit at high concentrations.	Medium, Technical
15	3.1.1.1	Please indicate that sulfolane, in addition to petroleum hydrocarbons, had been detected in historical groundwater samples collected from onsite monitoring wells (e.g., sulfolane detections from 2001 on-site investigation). Also, for sulfolane, it appears that there was sulfolane in wastewater so the wastewater lagoons, especially Lagoon B, are also primary sources. A site conceptual site model further evaluating sources and fate and transport of contaminants must be referenced.	Medium, Technical
16	3.2.3, 3.5.3 and Table 3-13	USEPA also developed a PPRTV subchronic inhalation reference concentration (RfC) of 2×10^{-2} mg/m^3. USEPA indicated there is low confidence in this value and no chronic inhalation reference concentration could be developed because of the high level of uncertainty. This should be discussed in Section 3.2.3 and qualitative discussion of the inhalation pathway should be included in Section 3.5.3.In addition, hazards from inhalation of particulates must be evaluated for the trench worker using the subchronic RfC for sulfolane. Using the current maximum onsite soil concentration for sulfolane and the subchronic RfC, these hazards would be minimal and should not impact overall site hazards or contribute to the risk-based cleanup level calculations.	Medium, Technical
17	2.6.1 and 3.1.2.1	The reason for rejecting some of the sulfolane data, specifically the soil data from the 2011 sampling event, must be discussed. Non-detected sulfolane samples outside of holding time are correctly identified as rejected in Appendix A, but must also be discussed in more detail in Section 2.6.1 or validation reports should be referenced.	Medium, Technical
18	2.6.2 and 3.5.2	Isopropanol and propylene glycol were analyzed in groundwater in 2012 sampling events. According Table B-6 of the 1st Quarter 2013 Groundwater Monitoring Report (May 2013), neither isopropanol nor propylene glycol were detected in groundwater on-site. As stated in Section 3.5.2, not including these two compounds as COPCs in the HHRA does not impact the overall risk at the site. The text should be revised to incorporate the new data.	Low, Technical
19	3.1.2.1	If FHR chooses to continue to include the exposure unit (EU) approach, additional information regarding how the contours and EUs are defined must be included, as agreed to in the January 20 comment resolution meeting. Further justification for averaging and use of the EU approach must be included. Also, please clarify that the three contours represent > 100 ug/L, **25-99 ug/L, and non-detect to 24.9 ug/L.** The description in Section 3.1.2.1 and Figure 3-3 does not match the description in Section 3.1.3.2. In addition, EPCs for each EU should be recalculated using the most current groundwater data.	High, Technical

No.	Section	Comment / Recommendation	Status
20	3.1.3.1.6	The text indicating that 14 of the plant types tested were confirmed to contain sulfolane, *primarily in the leaves and stems* (emphasis added), is misleading. Of the 14 plant types that had detectable levels of sulfolane, 5 were in leaves, 4 in fruits, 3 in roots and 2 in flowers. Please add a sentence that sulfolane was found in leaves, fruits, roots and flowers of the plants tested.	Low, Technical
21	3.5.4	During the HHRA comment resolution meetings, it was agreed that calculations will be presented for the alternative bioconcentration factor (BCF), please provide these calculations. Site-specific BCFs ranged significantly from no detected uptake to 127% (irrigation water to plant tissue). There is not sufficient data to average BCFs or calculate 95th UCLs from the data. For instance, averaging species-specific BCFs results in averaging at most four samples and, as in the case of green leaf lettuce, there is high variability within those four samples (i.e., BCFs of 18% to 100%). It was also agreed by the Toxicology Subgroup that the 2010 Garden Sampling Project did not provide sufficient data to derive BCFs. Use of a BCF of less than 100% is not approved by DEC.	High, Technical
22	3.1.3.2	The text states, "...unless there is site-specific evidence to the contrary, an individual receptor is assumed to be equally exposed to media within all portions of the EU during the time of the risk assessment." For this site, individual private drinking wells have been sampled. That is sufficient evidence to indicate that individual receptors are not being equally exposed to sulfolane in groundwater. EPCs within each exposure unit (EU) do not represent true exposure but provide information on management units or ranges of risk levels. If the EU approach is maintained, this difference must be clarified in the HHRA.	High, Technical
23	3.1.1.2, 3.1.3.2.6	Groundwater samples evaluated in this risk assessment only include wells that do not contain LNAPL. This is primarily a concern for indoor air evaluations. Impacts of contaminants in LNAPL on vapor intrusion to indoor air have not been evaluated in this risk assessment. Please evaluate the potential impact of LNAPL on indoor air quality at the site. Solely making this evaluation using groundwater data may not be appropriate and soil gas samples (collected in 2013) may be needed. In addition, a more complete evaluation of areas on-site where vapor intrusion to indoor air may be a potential issue must be provided. Please refer to DEC's *Vapor Intrusion Guidance for Contaminated Sites (October 2012)*, for additional guidance on evaluating this pathway.	High, Technical
24	3.1.3.2	Onsite wells with multiple sampling rounds were averaged together. Discussion of variability within rounds of sampling and potential impact of seasonal variability must be added to this section. Averaging multiple rounds of sampling, as to not weight the overall EU average by number of sampling events, is only valid if there is small variability within sampling events.	High, Technical
25	3.1.2.2 and Table 3-2a	Please note since May 2012, the USEPA's Regional Screening Levels (RSL) include sulfolane. These screening levels must be incorporated into the screening tables or footnoted. Since sulfolane was maintained as a COPC, adding the RSL values will not impact the hazard or risk-based cleanup levels calculated in the HHRA.	Low, Technical

No.	Section	Comment / Recommendation	Status
26	3.1.3.4 and 3.4	Current research shows that blood lead levels of 10 micrograms per deciliter of blood (µg/dL) in young children can result in lowered intelligence, reading and learning disabilities, impaired hearing, reduced attention span, hyperactivity, and antisocial behavior. However, there currently is no demonstrated safe concentration of lead in blood, and adverse health effects can occur at lower concentrations. On May 16, 2012 the CDC changed their definition of lead poisoning in children from 10 micrograms per deciliter (ug/dL) of blood to 5 ug/dL. Please revise this section to reflect a value of 5 ug/dL of blood as the blood lead level of concern. This should be referenced in this section and 5 ug/dL should be used as the threshold in the characterization of exposure to lead.	Medium, Technical
27	3.5.5	See comment regarding the statement that, "sulfolane presents no special concerns to children." Please note, a developmental study in mice was conducted and identified teratogenic effects but only a screening-level one-generation reproduction study in rats via the oral route is available (USEPA 2012).	Medium, Technical
28	4	Chapter 4, including supporting appendices (i.e., portions of Appendix D, portions of Appendix E, Appendix F, Appendix G, derivation of the alternative reference dose for sulfolane from Appendix H, and portions of Appendix J) shall not be included in the HHRA. The approach taken in Chapter 4, as well as supporting appendices, is not an approach supported by DEC regulations or guidance documents and is, therefore, not approved. No additional comments will be made on these sections of the HHRA.	High, Technical and Policy
29	5	Chapter 5 of the HHRA must only include alternative cleanup levels (ACLs) derived using the reference dose from the United States Environmental Protection Agency's Provisional Peer-Revised Toxicity Value (PPRTV) for Sulfolane (dated January 30, 2012) and the DEC approved exposure assumptions. The appropriate ACL for sulfolane in groundwater is 14 ug/L, derived from the PPRTV RfD and the ADEC-approved exposure assumptions.	High, Technical and Policy
30	Table 3-1 and Table 3-13	Note that an inhalation RfC (subchronic) is available from USEPA's PPRTV. This value must be added to the tables.	Low, Technical
31	Table 3-2a	Footnote i is not being correctly applied in this table. A number of detection limits have been added to this table from previous versions of the HHRA. In many instances the detection limits are sufficient for determining that the chemical is not a COPC. The table should be updated. A few instances, especially in groundwater, the detection limit is greater than the screening level but not identified as a COPC. This should be discussed in more detail as well as the impacts of excluding these compounds in the uncertainty analysis. Please clarify what <1 - <400 (as is shown for chlorobenzene, as an example) means. Please provide additional information regarding elimination of sulfate as a COPC.	Medium, Policy
32	Table 3-2a	Please indicate if diethyl phthalate is identified is a COPC is groundwater or not. Based on screening data provided the reviewer has assumed it is not a COPC in groundwater but this should be clarified.	Low, Technical

No.	Section	Comment / Recommendation	Status
33	Table 3-2a	A number of compounds have been identified as COPCs but needing further discussion with DEC (as indicated by footnote). Please provide status of these discussions in the response to the comments.	Medium, Technical
34	Table 3-2a and 3-2b	This table has a number of additional detection limits than have been provided in previous versions of the HHRA or RAWP. Please indicate how this table was updated in the response to comments and indicate the reason for these differences. Also, it appears Table 3-2b has not been updated to incorporate the additional detection limit information. A number of compounds still have "—" in the table when data is available. The table should be updated.	Low, Technical
35	Tables 3-2a, 3-2b and throughout	There are a number of compounds that have been identified as COPCs in Table 3-2b but where no EPC has been calculated and the compound is not included in the tables (i.e., 1,2,4-TMB, or chlorobenzene in Tables 3-2a and b). Based on comparison of tables to April 9, 2012 draft of the HHRA, it appears this is due to some COPCs identified as COPC based on elevated detection limits but no detections in the media of interest. Please clarify if this is the case or provide discussion of the reason. Add compounds to table, if appropriate. If compounds are identified as COPCs based on elevated detection limits but not quantitatively assessed in the HHRA, discuss in the Uncertainty Analysis.	Medium, Technical
36	Table 3-8a and b	Footnote b references LNAPL offsite. It is assumed this footnote is incorrect. No LNAPL has been identified offsite.	Low, Technical
37	Table 3-11	The Henry's Law Constant for sulfolane is reported in EPI v4.1 as 4.85E-6 atm-m^3/mol (H' = 1.98E-4) from Henrywin v 3.2 using the Bond Method. This value has also been used by USEPA in their Superfund Chemical Data Matrix (SCDM) entry for sulfolane. DEC prefers use of this value and method for derivation of the Henry's Law Constant for sulfolane.	Low, Technical
38	Table 3-3 and throughout	Please indicate what version of ProUCL was used. ProUCL v4.1 was available since July 2011 and should have been used to calculate the 95% upper confidence limit on the mean. Spot-checks of calculations indicate that v.4.1 was most likely used. Please clarify.	Medium, Technical
39	Table 3-13	ABS_{GI} values must be provided.	Medium, Technical
40	Appendix H	Derivation of an alternative reference dose for sulfolane is not supported by DEC. The memo by Dr. Brian Magee must be removed from this appendix. No further comments on the memo from this appendix will be made. Reference to this memo must be eliminated from the sulfolane toxicology profile included in this appendix.	High, Technical and Policy
41	Appendix K	Thank you for Dr. Farland's assessment. DEC has no comments on the content of the review since this represents Dr. Farland's evaluation and opinion of the data. Dr. Farland's assessment strongly supports the uncertainty in the sulfolane toxicity data and derivation of a single reference dose. His assessment also supports the need to be health protective when making regulatory decisions. The National Toxicity Program is undergoing additional toxicity studies on sulfolane to address some of these uncertainties. In the	High, Technical

No.	Section	Comment / Recommendation	Status
		meantime, the USEPA's PPRTV provides a health-protective reference dose value of which to base hazard estimates and which can be used to determine alternative cleanup levels at the site.	
42	July 18, 2012 Memo	Alternative ACL Calculations for Sulfolane in Groundwater (July 18, 2012) Consistent with DEC and USEPA RSLs, child assessment must use chronic toxicity values. This is consistent with the determination in DEC's July 19, 2012 letter to Loren Garner; therefore, no additional comments on this memorandum are necessary.	High, Policy